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ELECTRICAL WORLD

News Issue

DECEMBER 11, 1948

A McGRAW-HILL PUBLICATION

Justus F. Craemer, Who Has Been Elected President of the National Association of Railroad and Utilities Commissioners

CO-ORDINATED MAGNET & FRAME DESIGN HELPS CREATE A BETTER WATTHOUR METER

J. D. SEAVER, Engineer
Meter and Instrument Laboratory
West Lynn, Massachusetts

To greatly minimize side-thrust and vibration in the new I-50 watthour meter, the braking magnets have been placed diametrically opposite each other on the periphery of the disk and as close to the electromagnet as possible. To do this, many design and manufacturing problems had to be solved.

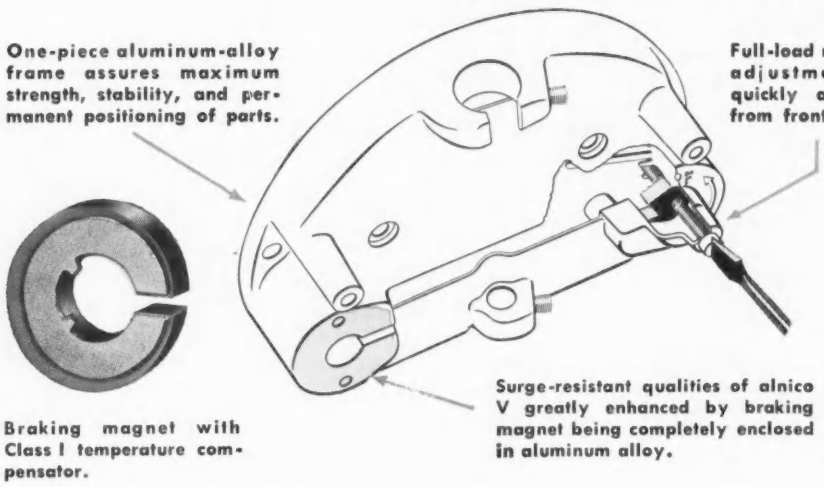
The well-known alnico V, with its high resistance to knockdown and its inherent stability, was a logical magnet alloy selection. But considerable development of special heat-treating methods was necessary to produce magnets of a usable and economical shape from this alloy—ones which would also preserve the desirable magnetic qualities inherently possible in alnico V. The I-50 magnets do. Besides their high strength, they have the extreme magnetic stability required for use in watthour meters.

The braking magnets were designed in a size and shape to permit them to be die-cast in the aluminum frame assembly. The aluminum permanently positions the magnets and provides excellent surge shielding for them as well.

All through the I-50 watthour meter are developments such as this which have brought into being what we believe to be the "first completely new watthour meter in fifty years"—one that has improved accuracy, longer life, and lower maintenance costs!

J. D. Seaver

Type I-50 COMBINES ACCURACY WITH LOW MAINTENANCE COSTS


One-piece aluminum-alloy frame assures maximum strength, stability, and permanent positioning of parts.
Full-load micrometer adjustment made quickly and easily from front of meter.
Braking magnet with Class I temperature compensator.
Surge-resistant qualities of alnico V greatly enhanced by braking magnet being completely enclosed in aluminum alloy.

MORE NEW FEATURES

1. **Magnetically suspended moving element to do away with bearing maintenance.**
2. **Simplified registers to make reading easier.**
3. **Improved, co-ordinated insulation to assure longer life.**
4. **One-piece molded "S" base to minimize corrosion.**
5. **Simplified unit-construction for long life and low maintenance costs.**

All these features—and more—make the I-50, both in the socket- and front-connected types, a completely new meter. Benefit from the lower maintenance costs and longer life of this meter. Order from your nearest G-E Sales Representative. Or write today for Bulletin GEA-5050. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

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NEWS OF THE ELECTRICAL WORLD

The Electrical Week

Privately owned utilities and municipal systems alone will spend $10.5 billion to add 26.8 million kw in the next five years . . . In Washington, the National Security Resources Board has submitted its second national power survey to the President. The good news is that no federal controls over power producers or over materials for power equipment manufacturers are considered necessary to assure sufficient electricity . . . Coincidentally, General Electric announced that its 1948 production of large turbine-generators will set a record—65 units of 2,932,000 kw . . . In New York, at the American Society of Mechanical Engineers annual meeting, a prediction was made that atomic power plants are only a few years away but economically a long time away . . . And on the Pacific Coast, an FPC examiner gave Pacific Gas & Electric Co a jolt by favoring the Bureau of Reclamation plan to develop Kings River hydro.

Southern California Edison Co has completed conversion of its system from 50 to 60 cycles. The job took 3 years and cost $37,500,000. For its 730,000 customers the utility replaced or adjusted 475,000 clocks, 380,000 fluorescent lighting fixtures, 160,000 record players, 58,000 refrigerators, 35,000 washing machines, and 7,800 deep-well pumps.

Gas is becoming more popular with utilities as a fuel for power generation. In October utilities used 20.6% more than in the corresponding month of 1947.

One appliance maker is now selling more dishwashers and garbage disposal units in 10 days than it sold during all of 1941.

California Congressman Norris Poulson told the California Municipal Utility Associaton that in the next Congress he expects the power issue to be fought in appropriations committees, where the vote will be determined by sectional rather than party interests.

As many as 200,000 of the homes which are expected to be built in the Southeast during the next few years may be in a price range which would permit consideration of heat pump installations. Companies there find the annual combined load factor of heat pumps to be about 25%. This isn't good, but it's better than the load factor for heating or cooling alone.

Outdoor generating plants are not favored in some mild-climate areas—too much rain for convenient maintenance.

The American Dispatchers Association, an organization of load dispatchers formed in 1946, now has 274 members representing 37 power systems in 18 states, Hawaii, and British Columbia. Lloyd Benson, Seattle (Wash.) City Light, is president.

Potomac Electric Power Co will use $713,511 in a deferred credit account toward offsetting an anticipated $839,370 deficiency in earnings during 1948.

More and more neon advertising signs are making their appearance in Moscow. One atop the National Hotel, on one of the central squares of the city, advertises, of all things, Soviet Champagne.

Notes From The News

A United Mine Workers official has announced that when present contracts with soft coal operators expire the miners will seek a 35 instead of a 40-hour week . . . A voluntary power conservation program in the Northwest has resulted in peak-period savings of nearly 35,000 kw for Puget Sound Power & Light Co and about 19,000 kw for Seattle City Light . . . The Camden, S. C., municipal system has come up with a new idea to raise funds. It is planning to sell its rural lines to get money to improve its urban system . . . Memphis Light is seeking an additional 10,000 kw from TVA to boost its electric supply to 205,000 kw.

An application by the Electric Power Co of New Jersey, Trenton, for a license to build a hydroelectric project on the Delaware River has been denied by FPC . . . Westinghouse Electric Corp reports that it has manufactured its five millionth transformer. The 25-kva, 7,200-v CSP transformer has been installed in Wichita, Kan . . . An investi-

DEAD FROM A HEART ATTACK, Dewey Dalgreen, service installer for the Cincinnati Gas & Electric Co, is lowered from a pole in downtown Cincinnati. Firemen were called to assist crew members

gation of the rates charged Georgia Power & Light Co by its parent, Florida Power Corp, has been ordered by FPC . . . C. Donald Dallas, chairman of the board of Revere Copper & Brass, Inc, has asked the Economic Cooperation Administration to spur output of foreign copper.

Canadians are disappointed at President Truman's opposition to the New York-Ontario St. Lawrence project. The President believes the project should include navigation as well as power . . . The Union of South Africa is facing a water shortage. The people are considering a project similar to the long-range Tennessee Valley Authority . . . Florida Power Corp and the City of Gainesville have signed a power interchange agreement which will aid the utility during peak periods and the municipal system at all other times . . . TVA wants to lease Watts Bar Village, which served as a construction camp for Watts Bar Dam workers, to a private operator for use as a recreation center.

Financial:

If you want to profit by the rapid growth of television, a Boston financial writer suggests that you invest your money in stocks of operating electric utilities since they are the ones who will make the most money out of television . . . Merger of the New England Power Co and the Eastern Massachusetts Electric Co, subsidiaries of the New England Electric System, has been approved by the Massachusetts Department of Public Utilities . . . Directors of Electric Bond & Share Co have ordered a dividend payment to common stockholders, payable in common stock of Carolina Power & Light Co. One share of Carolina will be given for every 60 shares of Bond & Share. Those not owning 60 shares will receive 50¢ for each share.

Common stock of Madison Gas & Electric Co will be distributed to stockholders of American Light & Traction Co at the rate of one share of Madison for each ten shares of American Light . . . Northern Indiana Public Service Co has declared a dividend of 30¢ a share on its common stock . . . Duke Power Co is seeking FPC approval to issue $40,000,000 in $3\frac{1}{8}\%$ first and refunding mortgage bonds due in 1978 . . . Community Public Service Co, Fort Worth, Tex., has been authorized by the FPC to issue $1,500,000 of short-term promissory notes bearing $2\frac{1}{2}\%$ interest.

Commercial:

Sears, Roebuck & Co has cut prices on its entire refrigerator line from 2 to 10%. Purpose given was to stimulate sales . . . In New York City dealers are doing the price cutting. Smaller independents are cutting top-brand refrigerators as much as 20% . . . E. B. Ingraham, president of the National Electrical Wholesalers Association, in a year-end statement stressed that in 1949 the entire appliance industry will depend on stepped-up selling and promotional efforts . . . A radio and television show put on by the Dayton Power & Light Co in cooperation with local distributors led to sales of 574 console radios, 592 table models, and 111 television sets. Attendance at the show was only 7,500.

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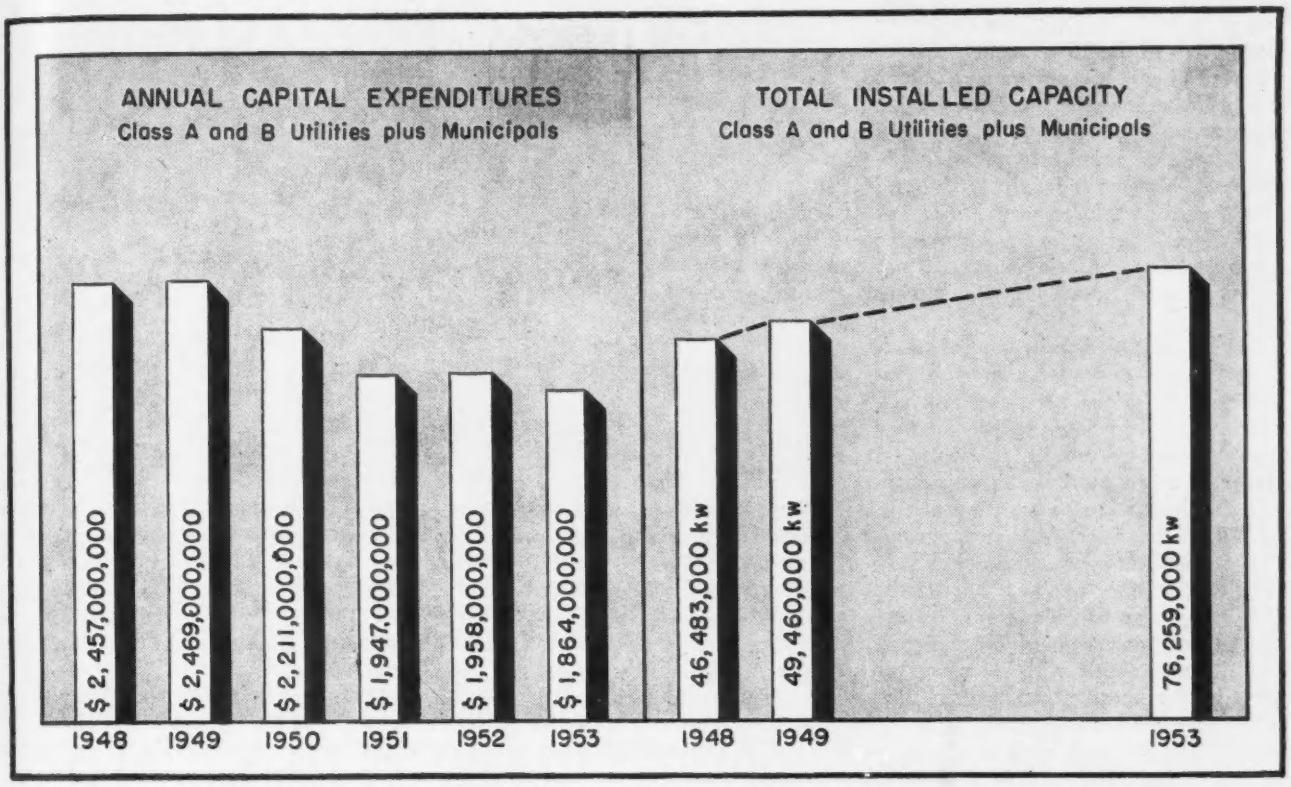

5-Year Construction Bill, $10.5 Billion

Survey of Private and Municipal Systems Indicates 26.8 Million Kilowatts Will Be Added; 70% of Needed Money Must Be Secured from Outside Sources

AN EXPENDITURE of $10.5 billion, adding 26.8 million kw to present generating capacity, is estimated for the electric utilities in the years 1949-1953, inclusive. This estimate was calculated from power company returns in a survey made by ELECTRICAL WORLD as part of an overall industry picture being developed by the Economics Department of the McGraw-Hill Publishing Co. The purpose of the survey was "to find out how much industry wants to spend and can afford to spend profitably—on new plant and equipment in the next 5 years."

Those to whom questionnaires were sent were asked to assume that:

"Prosperity will continue, though competitive selling will return.

"Overall demand for industry's products will rise by about 15% because of a 5% growth in population and a steady rise in living standards.

"Wage rates will rise; so there will be pressure to install cost-cutting equipment.

"Construction costs, equipment prices, interest rates, and taxes will stay at about their present levels.

"New capital will be as hard (or easy) to get as it is today."

Returns were received from 24 utilities, large and small. Together they represent 29.3% of the installed capacity and 25.1% of the customers of the power company and municipal electric systems. Data from them were expanded to represent the whole industry, on the assumption that heaviest emphasis in the next 5 years would continue to be on construction of production plant.

The chart above shows annual construction expenditures averaging well above $2 billion for the next 5 years—including a small amount of gas equipment. Generating capacity is expected to rise from about 49.5 million kw now to 76.3 million at the end of 1953. Capacity now scheduled for delivery in the 4 years 1949-1952 is reported from other sources as 15.3 million kw, with over 6 million in the largest year, 1950. To achieve the 5-year increase of 27 million kw estimated from the survey returns, a considerable number of capacity equipment orders will be placed for the 3 years after 1950.

Included in the survey were questions as to methods of financing. Reporting a total of $389 million as their 1949 budget, 15 utilities furnished information. From analysis of this group it appears that these utilities expect to finance construction as follows: about 30% from internal sources, 40% from bonds and notes, 10% from preferred stock, and 20% from common stock. Assuming that these ratios hold for the whole industry, five-year utility financing will include about $4 billion in bonds and notes, about $2 billion in common stocks, and about $1 billion in preferred.

ELECTRICAL WORLD's annual survey of utility construction and expenditures is now in progress, and the results will be published next month. This survey will cover over 80% of the industry and probably will show 1949 financing with

2 Not "to", Too Bad

In making a correction by telephone in the tables with the story "Utilities Making Money but not Enough" on Page 77 of the Dec 4 issue, an error was made. The size of the utilities by operating revenues should have read 5 plus to 10 etc instead of 5 plus 210 etc as given.

much smaller equity ratios than are indicated here for the 5-year period. With respect to these ratios, it is worth noting that only 5 of the 15 reporting utilities reported plans to issue preferred stock and 3 of the 5 were among the largest represented in the survey.

"Finance program has not been determined." "Plans indefinite." "Beyond 1949 we cannot foresee our needs or methods of financing them." These were comments from utilities that did not respond to the question on financing ratios.

Against the indefiniteness of such comments are others reflecting full confidence. "We do not anticipate any real difficulty in securing additional new capital. The price will probably be higher, but it should be higher; rates will simply have to be adjusted to pay the bill." "The order of issuance of common stock, preferred stock, or bonds cannot now be determined, but it will be our objective to include appropriate amounts of each type of financing so that the end result will be a capital structure comparable to that which has been consistently maintained for many years." The company making the foregoing comment has averaged 39% debt, 17% preferred, and 44% common stock over the past 25 years.

The whole result of the survey is pretty well summed up in a comment from one of the smaller utilities:

"We believe our estimates are conservative. The demand for electric energy is increasing constantly because of new uses, new customers, and increased usage by present customers. There is a national shortage in electric generating capacity, and it will require years of construction before the industry will have a reserve equivalent to that which existed before the war."

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New York Utility Agrees to Expand Rural Service

New York State Electric & Gas Corp has given the Public Service Commission assurance that it will build line extensions and provide service for rural residents near Elizabethtown by June 1, 1949. If the company does not appear to be complying with its commitments by next spring, the Commission will take appropriate steps.

According to a complaint filed with the Commission, residents of the area have been trying to get electric service for some time but have been unable to persuade the company to undertake the necessary construction. The utility said it has been unable to meet all requests for service.

Power Supply, Equipment Output Enough for Arms, Aid Programs

UNCLE SAM CAN stage his Rearmament and European Aid programs—in their present proportions, at least—and still get sufficient electric power without resorting to federal controls.

Manufacturers of all types of power equipment are convinced they can maintain their present record output without mandatory scheduling of production or allocation of materials. Only a "sharp and substantial increase" in power requirements for defense production would necessitate mandatory curtailment of electric utility service on a broad scale.

These are conclusions of the National Security Resources Board's second national power survey, which was submitted to the President this week.

As did the first NSRB power report last May, the new survey looks at energy supply for the next four years from the twin viewpoints of anticipated capacity and demand of utility systems and ability of manufacturers to produce generating equipment.

Under adverse water conditions, which would hold down hydro generation, the report foresees national reserve margins of 1.6% in 1948 and 10.3% in 1951. This compares with the May estimate of reserves ranging from 3.7% this year to 11.2% in 1951. This decline in the face of new equipment orders and stepped-up production by manufacturers results from boosts in estimates of peak loads since May, the report says. Load estimates used, the report points out, are those of regional power pools and local utilities, both public and privately owned.

Power supply will be "especially critical" in the next few weeks, the period of annual peak loads. NSRB sees the margin of capacity over load as "inadequate for proper operating reserves" throughout the country during this time. But by the end of 1951 reserves will be sufficient almost everywhere except in the Pacific Northwest and the Southeast. Only good water years will pull the Northwest through, the report predicts, with the Southeast maintaining a thin reserve margin—2.9% by 1951 under adverse water conditions, 5.8% under median conditions. TVA predicts a deficit on its own system in 1951, regardless of stream flow. It anticipates an 8.5% deficit then under adverse conditions, 1.5% under median conditions.

The report estimates national capacity for the next four years, under median and adverse hydro conditions, as follows:

Adverse: 1948—53,794,000 kw; 1949—60,018,000 kw; 1950—65,547,000 kw; 1951—71,629,000 kw. Median: 1948—54,742,000 kw; 1949—61,243,000 kw; 1950—67,042,000 kw; 1951—73,456,000 kw.

Peak loads are estimated at 52,945,000 kw in 1948 and 64,961,000 kw in 1951.

NSRB found equipment manufacturers had firm orders for generating equipment with a total capacity of 23,849,000 kw for delivery within the four-year period. These included large steam-turbine generators rated at 17,879,000 kw, small steam-turbine generators at 1,522,000 kw, and water wheel generators at 4,448,000 kw. Of the total equipment on order, 87% is being built for domestic utility systems, 5% for industrial plants in the United States, and 8% for export.

Manufacturers reported ability to accept some orders now for delivery of small steam turbines in 1950. Manufacturing capacity is open for equipment to be delivered in 1951, in the following proportions:

Large steam-turbine generators—4,200,000 kw; small steam-turbine generators—1,125,000 kw; water wheel generators—1,500,000 kw.

Edward Falck, chief power and utilities consultant for NSRB, presented the survey with a warning that the industry can not afford a "relaxation" in the expansion program now "so well underway." All bets are off, he added, on NSRB's capacity and load forecasts if national defense programs impose unforeseen requirements on the nation's generating plants. And manufacturing capability estimates contemplate no strikes or new material shortages.

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Anti-Trust Suit Names Seattle Contracting Group

The Seattle Electrical Contractors Association is charged with conspiring to restrain trade in violation of the anti-trust act in a criminal information filed in federal court at Seattle.

The information is similar to a federal grand jury indictment returned at Seattle early this year, which later was dismissed on a technicality. It charges the association, four corporations, and 12 individuals with "arbitrarily setting" electrical installation prices in the Seattle area since 1936. All the defendants pleaded not guilty to the indictment before it was dismissed.

CINCINNATI GAS & ELECTRIC CO executives, who have been planning the new 80,000-kw Clermont Station, 17 miles east of downtown Cincinnati, are ready to break ground for the plant. Left to right are E. S. Fields, vice-president and general manager; Edgar Dow Gilman, director of public utilities, City of Cincinnati; Walter C. Beckjord, president; and D. S. Brown, vice-president in charge of electric production

GE Breaks Record by Producing 65 Turbine-Generators in 1948

General Electric Co's production of large turbine-generators for electric utilities in 1948 will exceed that of any previous year by more than 1,000,000 kw. In number of units, production this year will exceed by 11 the number produced in any other peacetime year.

In all, 65 units with a total generating capacity of about 2,932,000 kw, an average of about 45,000 kw per unit, will be produced in the Schenectady plant. This more than doubles in capacity the plant's 1947 production of 1,200,000 kw, when 34 units with an average rating of 35,300 kw were turned out. More than 2,000,000 kw of this year's production have already been placed in operation.

Smaller units produced at the Lynn River and Fitchburg, Mass., Works represent an output of 650,000 kw. These included turbine-generators and turbines for a large variety of industrial plants, some utilities, and ships.

During the year a number of utilities ordered gas turbine power plants. Construction was started on two 3,500-kw units. Oklahoma Gas & Electric Co will operate one of these with natural gas as fuel and will use the exhaust gases to heat boiler feed-water. Central Maine Power Co will use oil in the other. This turbine will be installed in an existing station to replace a 2,000-kw, 1,800-rpm steam unit.

Two 5,000-kw high efficiency gas turbine power plants for the Public Service Co of Oklahoma will utilize natural gas as fuel. Also on order is a similar 5,000-kw unit for the Bangor Hydro Electric Co. This unit will be oil-fired.

The 5,000-kw gas turbines are the largest so far ordered for utility service in the United States. They will utilize intercooling and regenerative heat-transfer surfaces to recover waste heat. J. W. Belanger, manager of GE's turbine divisions, said it is expected that the fuel economy of these plants will be competitive with steam plants of equal size.

The GE spokesman pointed out that 1948 saw renewed interest in the resuperheating cycle, which has been applied to 2,000,000 kw of Schenectady-built turbines in the past 20 years. Twenty-two units, with more than 2,000,000 kw of capacity for the resuperheating cycle, now are being built at Schenectady. Initial pressures range from 1250 to 2000 psi gage, and initial temperatures from 950 to 1,050 F. The units with 950 F temperature resuperheat to that temperature while those with 1,000 to 1,050 F temperature resuperheat at 1,000 F.

During 1948 the first turbine to operate at 1,050 F, a 100,000-kw, 3,600-rpm, tandem-compound, triple-flow unit, went into service in the Sewaren Station of Public Service Electric & Gas Co, New Jersey. The turbine has eight points of steam extraction for feed-water heat, three of which are inside the exhaust connection to the condensor.

GE is now moving equipment into the new Schenectady turbine plant.

NSRB's Future Doubtful as Chairman Hill Quits

The resignation of Arthur M. Hill as chairman of the National Security Resources Board this week (Dec 6) left the future of that agency in considerable doubt.

Hill, who had headed NSRB since it was established in 1947, has been engaged in an almost constant dispute with members of the President's Cabinet, who also enjoyed membership on NSRB. The debate principally involved functions of NSRB, which was set up to draft industrial moblization plans for a future war emergency.

Having authority to confer with business groups in every field, NSRB rapidly became a major source of government contact with industry. In the electric power field, for example, the agency drew heavily upon utility company sources for information in compiling data on the nation's energy requirements and its ability to meet them.

Hill's latest disagreement with other Washington officials reportedly involved NSRB's future role in emergency planning. Hill is said to have demanded WPB-type authority for the agency, including power to direct compliance of other federal departments with emergency regulations. This issue became increasingly pertinent as the Administration shaped its impending request to Congress for some types of industrial controls for use when and where needed.

No other resignations of top NSRB officials were expected immediately. Should the agency be relegated to the position of a mere planning body, without authority to back up its proposals, it may lose other key personnel.

Hill is expected to return to his old job as president of Greyhound Bus Co.

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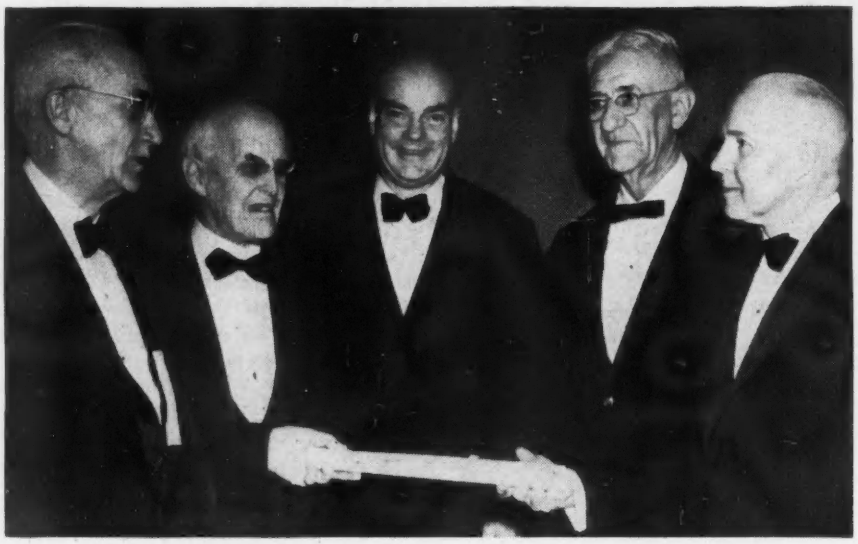
Union Electric to Add 110,000-Kw Generator

Plans for a new 110,000-kw generator, largest ever projected for the St. Louis area, have been announced by Union Electric Co of Missouri. The new generator is scheduled for installation in 1952. It may be put in an addition to the Venice, Ill., plant or an entirely new plant may be built elsewhere to house it.

This installation is part of a 15-year, $386,000,000 expansion program contemplated by Union Electric. The new generator, plus the other generating capacity currently being added to the system, will bring Union Electric's total capacity to approximately 1,400,000 kw in 1952.



HONORARY MEMBERSHIP in the American Society of Mechanical Engineers was conferred last week on five outstanding men in the fields of engineering, industry, invention, and education. With ASME president, E. G. Bailey, at left, are four of the honorees: George I. Rockwood, chairman of the board of trustees of Worcester Polytechnic Institute; James W. Parker, president of Detroit Edison Co; Oscar A. Leutwiler, professor emeritus of mechanical engineering, University of Illinois; and Carl F. Braun, president of C. F. Braun & Co, Alhambra, Calif. Missing is Dr Lyman J. Briggs, director emeritus, Bureau of Standards

Atomic Power Costly, Gas Turbines Have Limited Use, ASME Informed

SELDOM HAS the new era in power technology been more evident than it was last week in New York. Here in a series of sessions on atomic energy, gas turbines and synthetic fuel developments, members of the American Society of Mechanical Engineers held their 69th annual meeting.

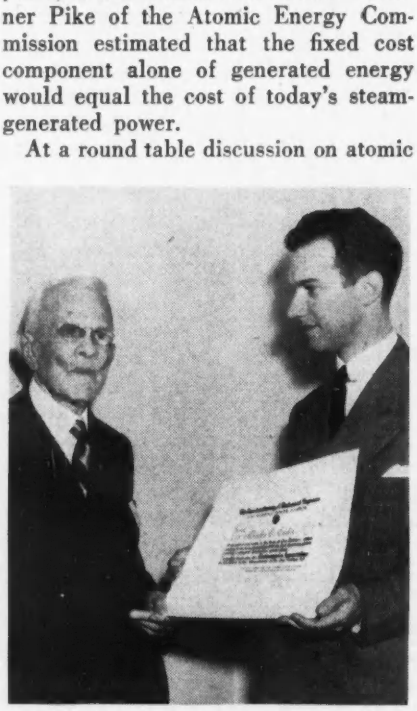
Several basic conclusions boiled out of the stew of gas turbine performance data, Mach numbers, net-gain reactors, and breeder piles.

Atomic energy experts agreed that power as a by-product of pile operation is only a few years away but is still a long way from being economical and that engineers can do more than pure scientists today to industrialize the atom. Key problems are nuclear "garbage" disposal, coolants for high-temperature heat exchangers, industrial uses for high (2,000 F) temperature bi-product heat, and a long-life supply of "pretty good" uranium ore.

Gas turbines for power generation rated 5,000 kw, are to be installed by a few utilities to burn natural gas fuel or Bunker C fuel oil. Design is completed, but none is ready to install. Expected performance is around 12,900 Btu per kwhr. At least until reliability is proven, utility application is expected to be limited to low load factor peaking operation in cheap-fuel areas. [*See story on General Electric Co, Page* 11]

While this country will have a working atomic power plant within a few years, it will not be economical. Sumner Pike of the Atomic Energy Commission estimated that the fixed cost component alone of generated energy would equal the cost of today's steam-generated power.

At a round table discussion on atomic power Pike said four engineering problems must be solved before we can get power from the high temperature by-product heat of an atomic reactor: (1) Locate a structural material for the pile that will stand high heat and have a high strength-weight ratio, (2) find an efficient coolant, for high-temperature heat exchanger, that has poor neutron absorption properties, (3) find a way to dispose of radioactive "garbage" from atomic fission, (4) locate a plentiful supply of "pretty good" uranium ore that is not too costly to purify.



CHARLES G. CURTIS receives from Dr J. T. Rettaliata, dean of engineering, Illinois Institute of Technology, the first annual award of the Gas Turbine Power Division of ASME for the work which led to his receiving in 1899 the first American patent covering a complete gas turbine power plant

James W. Parker, chairman of the industrial advisory committee to the AEC, urged engineers and industrial leaders to determine what use could be made of high-temperature heat either directly or as power. He urged them to place a dollar value on such heat if delivered at remote and at near-metropolitan locations. Such data would help AEC compute relative costs of atomic power and recommend areas where it could be utilized.

Dr. John J. Grebe chemist of Dow Chemical Co said that a lot of high-temperature heat energy is going to be wasted in producing atomic weapons unless engineers can find ways to use it on the spot or convert it into energy forms that can be shipped and reconverted. Plentiful supplies of cheap fuels in this country may hinder technological development in this field by removing economic compulsion, Grebe warned. Other countries under the spur of compulsion may outstrip the U. S.

If electric loads in the next 30 years grow at half the rate of the last 30, U. S. generating capacity will be five times what it is today, Walker Cisler, executive vice-president of Detroit Edison Co, predicted. While noting the great opportunity that exists for use of gas turbines in the power field both here and abroad, he doubted that they would replace the steam turbine in the foreseeable future, if ever. Yet he warned against thinking of the gas turbine only as a peak load carrier or auxiliary source of generation. Developments should move simultaneously toward: (1) Higher efficiency and sustained operation where fuel costs are high and base loads must be carried and (2) acceptable lower efficiency for less continuous operation.

Design of a 5,000-kw gas turbine for central station service, having an expected thermal performance of 12,900 Btu per kwhr burning Bunker C fuel oil, was described by Alan Howard and C. J. Walker, General Electric. The cycle comprises two compression stages with an intercooler and regenerator. The two-stage high-pressure turbine discharged directly to the single-stage low-pressure turbine. Turbine inlet

temperature is to be 1,500 F. Anticipated quick starting characteristics and good light load performance are expected to make it attractive for standby, peak load, and end-of-line service, the authors anticipated.

Immediate development of synthetic fuel plants was urged upon industry by W. C. Schroeder, U. S. Bureau of Mines. Schroeder told a fuels luncheon that an additional 1½-2 million barrels per day will be needed to meet future civilian oil needs. Synthetic oil from coal and oil shale offer an assured supply for hundreds of years, he asserted, but it will not be available 5 or 10 years hence if development work is permitted to lag today.

A symposium on progress in the automatic control of steam plants found utility and industrial engineers, control manufacturers and consulting engineers strongly in favor of centralization and automatization of controls. Reduction in attendance and improved station operating economy were advanced as factors offsetting high first cost of today's plants.

V. E. Estcourt, Pacific Gas & Electric Co, noted that the objective of centralized control is to place operators near equipment. This will reduce necessary attendance and increase the amount of automatic control required, but it is still economical, Estcourt believed. Paul Gravelle, Toledo Edison Co, said much remains to be done to secure station control that is simple to hook up and yet easy to restore in the event of a "spill", a point also emphasized by T. T. Frankenburg, American Gas & Electric Service Co. Ability to maintain operation under upset conditions and to return to line rapidly after loss of load were vital criteria for automatic control, Frankenburg said.

Joseph Pope, vice-president, Stone & Webster Corp, said cooperation between utility companies and industry in the generation and use of steam and electricity can ease the plant investment problem, lessen construction difficulties, and reduce fuel costs. As an example he cited the industrial area of North Baton Rouge, La., where 155 billion lb of steam and 5¼ billion kwhr representing an income of $34 million have been sold to combination customers in the last 18 years by Gulf States Utilities Co.

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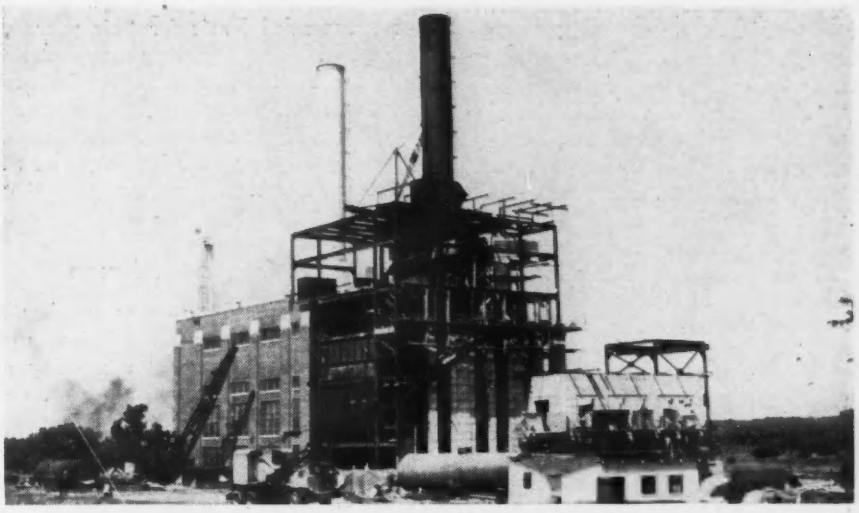
Voters Renew Franchise

Citizens of Clarksdale, Miss., have voted to renew a 25-year franchise of Mississippi Power & Light Co. Under the terms the company will pay the city 2% of gross revenues of residential and commercial sales.



LINCOLN BEERBOWER PLANT of the Oklahoma Gas & Electric Co, near Ponca City, will have a capacity of 42,000 kw when new 25,000-kw unit and boilers are installed

FPC Examiner Backs Reclamation's over PG&E's Plan for Kings River

Pacific Gas & Electric Co's plans for hydroelectric development of California's Kings River got a jolt from a Federal Power Commission examiner last week (Dec 3). The examiner urged FPC to sidetrack proposed projects of the company in favor of a hastily-assembled development program of the Bureau of Reclamation.

At stake is a proposed $60,310,000 program for development of upstream hydro sites by PG&E, involving installation of new generating facilities with a capacity of nearly 350,000 hp. The Fresno Irrigation District also has been seeking FPC approval of plans to develop the stream.

Under FPC procedure the "recommended decision" of Examiner Maximilian G. Baron in the matter requires action by the Commission. An internal debate over the decision looms, since it departs from previous recommendations of the FPC staff on Kings River development. The staff, PG&E, and the Fresno District are expected to file protests before the deadline of Dec 21.

Examiner Baron recommended federal development of the stream on grounds that it would be "consistent policy" for FPC to deny other applications until the President and Congress acted upon Reclamation's program.

He described PG&E's plans as having economic and engineering feasibility, but declared they were not "comprehensive" since they made no provision for development of the upper north fork of the river. The Fresno District's application lacks "sufficient detail" to permit its classification as a comprehensive plan, he added.

The battle over development of the Kings River came to a head this year when the Army Engineers started construction of Pine Flat Dam on the stream some 20 miles north of Fresno. Though the authorization for Pine Flat calls for no power installation there, its completion will open the way for upstream hydro development.

Interest of the Reclamation Bureau stems from its proposed irrigation development in the river basin. Spokesmen for the Bureau intervened in FPC hearings held in Fresno last January. They contended the Bureau would have to develop the available power sites in order to make its irrigation projects economically feasible.

But it was not until last July 29 that the Bureau sent a plan for development of the Upper Kings River to the President. It is assumed that this program eventually will be sent to Congress.

Other parties to the FPC proceedings contended that, at best, the Bureau's power plans are long-range while the area needs additional energy immediately. They also questioned the engineering feasibility of the Reclamation plans.

PG&E asked FPC for a license to build three new projects, including several dams and power plants, on the stream and its tributaries. It also sought approval of proposed expansion of its existing Balch powerhouse at Fresno, with addition of three 33,000-kva generators.

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Classification of Sales, September

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Rural (Distinct rural rates)	733	607	+20.7
Commercial or industrial			
Small light and power	3,805	3,406	+11.7
Large light and power	10,721	9,724	+10.2
Street and highway lighting	206	193	+ 7.0
Other public authorities	515	490	+ 5.0
Railways and railroads			
Street & interurban	297	319	− 6.6
Electrified steam railroads	195	199	− 2.2
Interdepartmental	50	45	+10.3
Total to ultimate customers	20,539	18,496	+11.0

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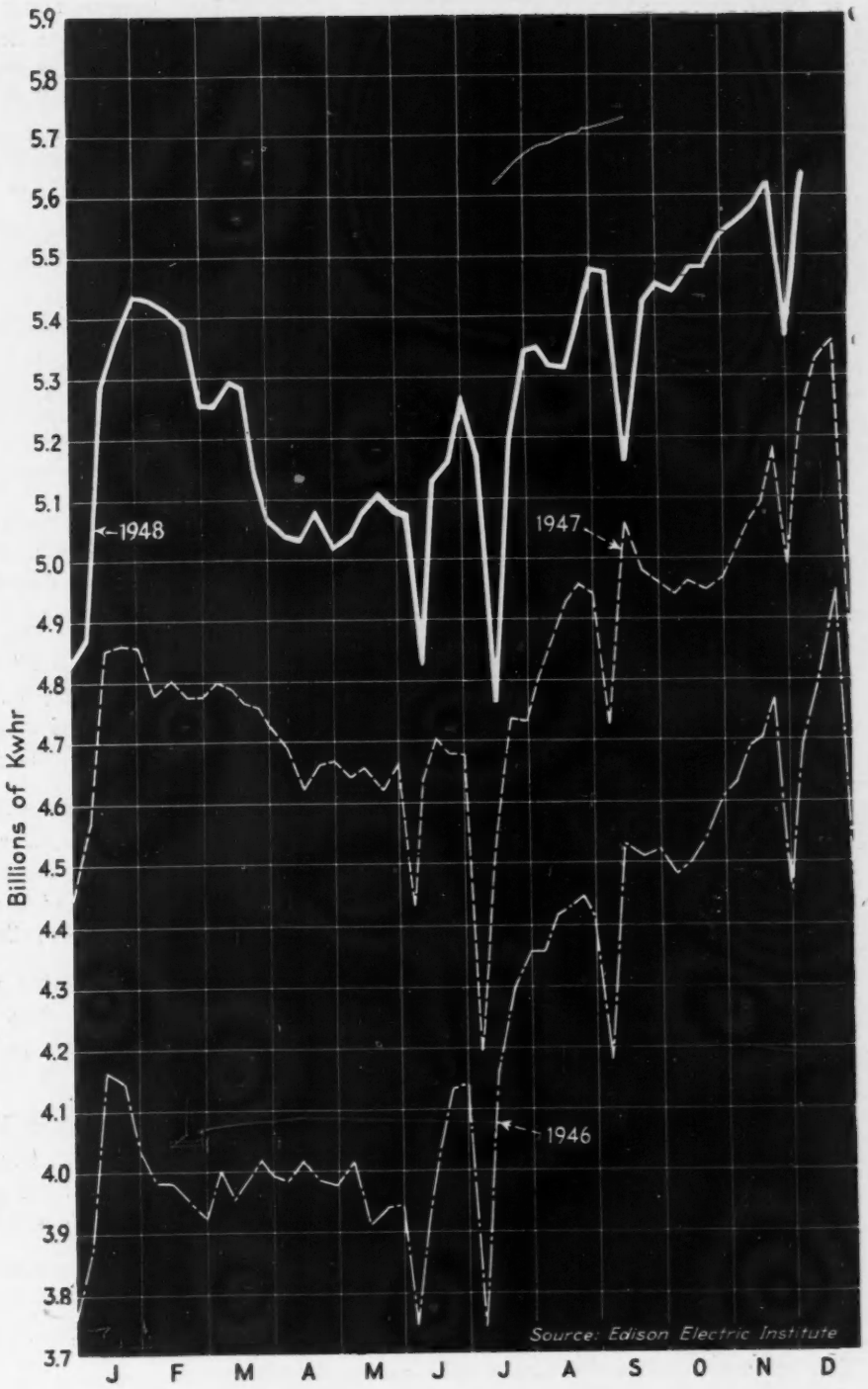

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The expected climb to the December peak started last week when output for the week ended Dec 4 reached the record high of 5,645,686,000 kwhr, but only 8.2% above the corresponding week a year ago.

Most of the news concerns a revision of figures for the week ended Nov 27. The revised total for that week is 5,349,167,000 kwhr, 7.3% above the corresponding week of 1947. The increase over last year for the Southern States was 8.9% instead of 11.1%.

The biggest increase for the week ended Dec 4 was reported by the Rocky Mountain States, 14.6% above last year. The New England States had the smallest gain, only 3%.

Weekly Output, Millions Kwhr

1948	1947	1946
Dec 4 5,646	Dec 6 5,218	Dec 7 4,673
Nov 27 5,349	Nov 29 4,983	Nov 30 4,448
Nov 20 5,627	Nov 22 5,180	Nov 23 4,765

Percent Change from Previous Year

	Dec 4	Nov 27	Nov 20
New England	+ 3.0	+ 3.1	+ 3.8
Mid-Atlantic	+ 4.9	+ 3.6	+ 4.1
Central Industrial	+ 7.4	+ 6.7	+ 8.0
West Central	+10.3	+ 7.8	+ 8.2
Southern States	+10.6	+ 8.9	+10.7
Rocky Mountain	+14.6	+17.3	+21.1
Pacific Coast	+ 9.4	+ 9.4	+10.9
Total United States	+ 8.2	+ 7.3	+ 8.6

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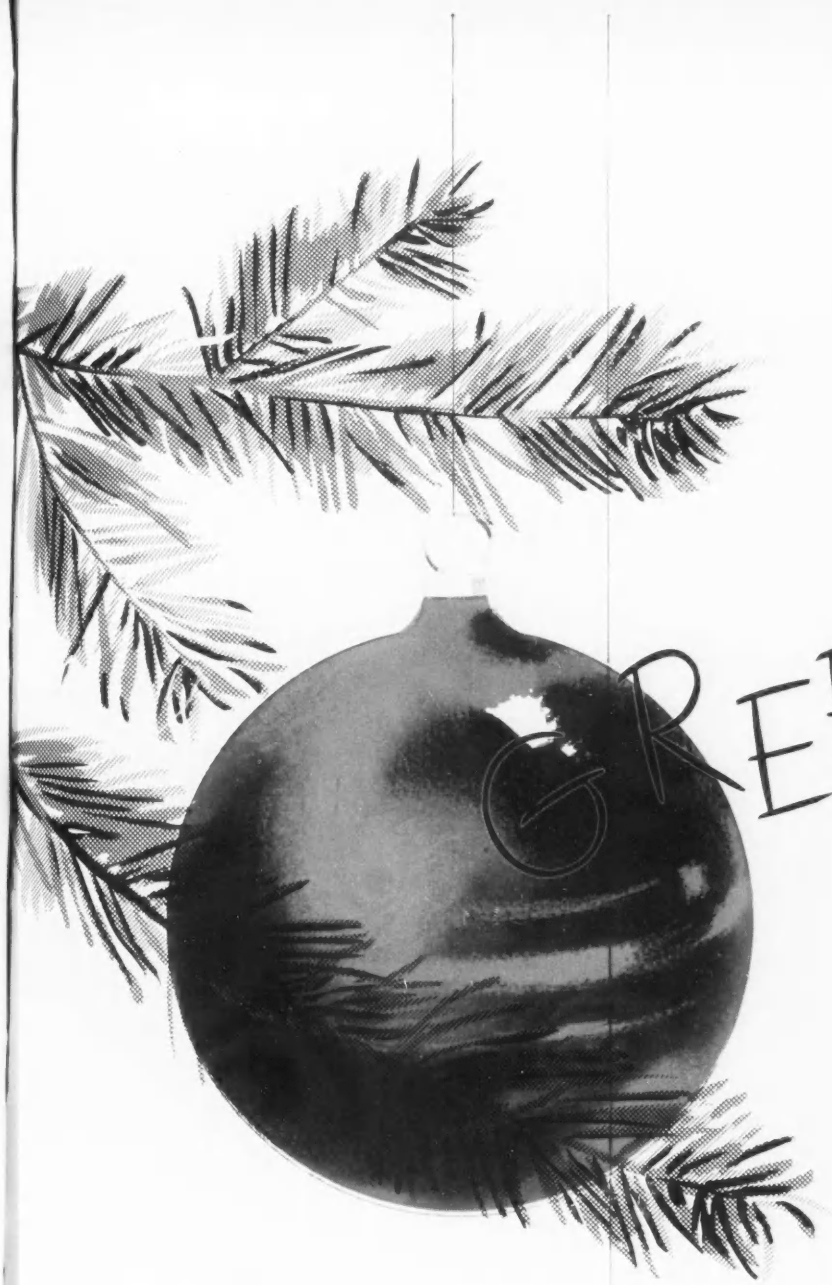


GREETINGS!

To all our friends and associates
in the industry...

Best wishes
for a happy holiday season,
and a successful
and prosperous New Year . . .

from all the men and women
in the Line Material family.

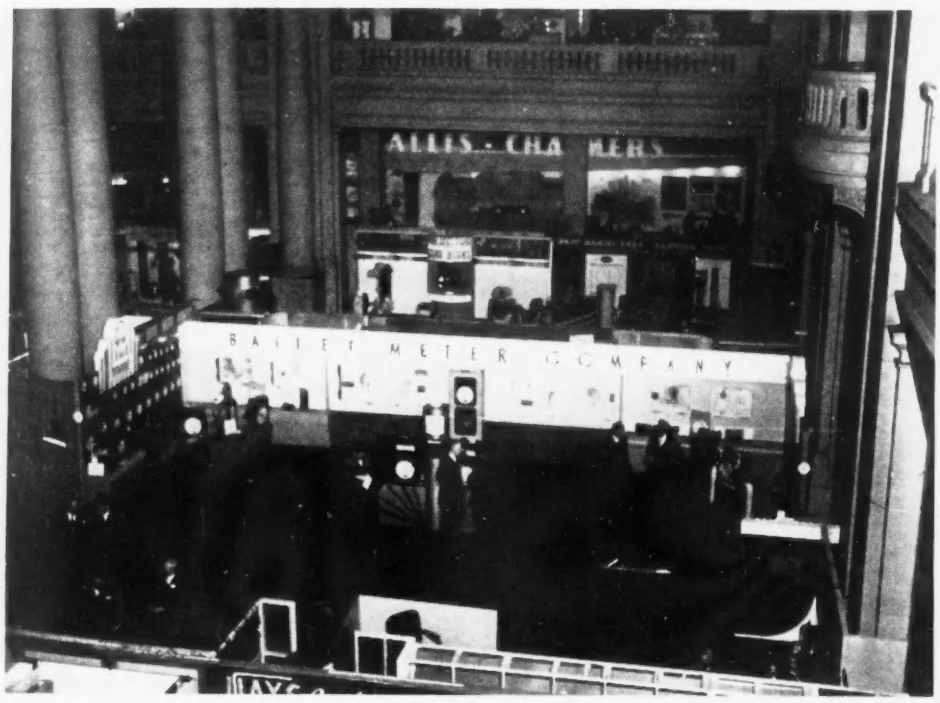
More fun at Christmas

L-M's 11th annual Christmas Book is now being mailed. It's a jolly collection of Christmas stories and verse for the whole family—with a cutout to keep the younger set busy Christmas afternoon. If you don't get a copy and would like one, please let us know.

Line Material Company, Milwaukee 1, Wisconsin

18th NATIONAL POWE

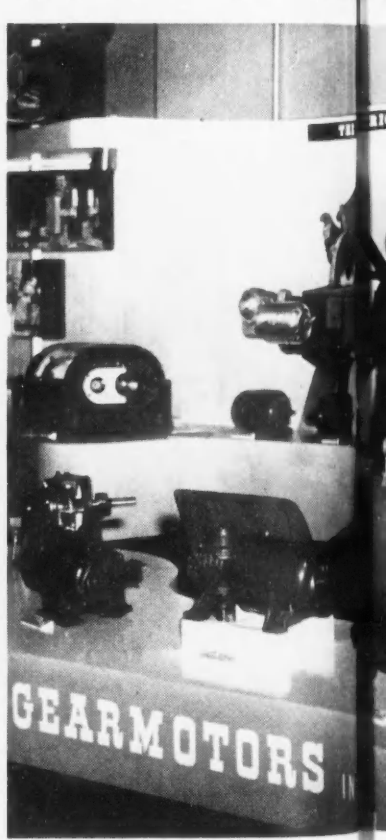
Grand Central Palace, New York City, November 29 to Decembe



BAILEY METER CO display, featuring smoke density recorder, dominates first floor panorama. In background are displays of Philadelphia Gear Works, Prat-Daniel Corp, and Allis-Chalmers Mfg Co

LEEDS & NORTHRUP CO exhibit f application of a new 140-point temperatu

GENERAL CABLE CORP displayed wire and cable ranging from magnet wire to high-voltage, paper-insulated, pipe-type cable. Hollow copper conductor for 500-kv Tidd experimental line was shown



MASTER ELECTRIC CO exhibited a shaft arrangements and speed ratios. Rig

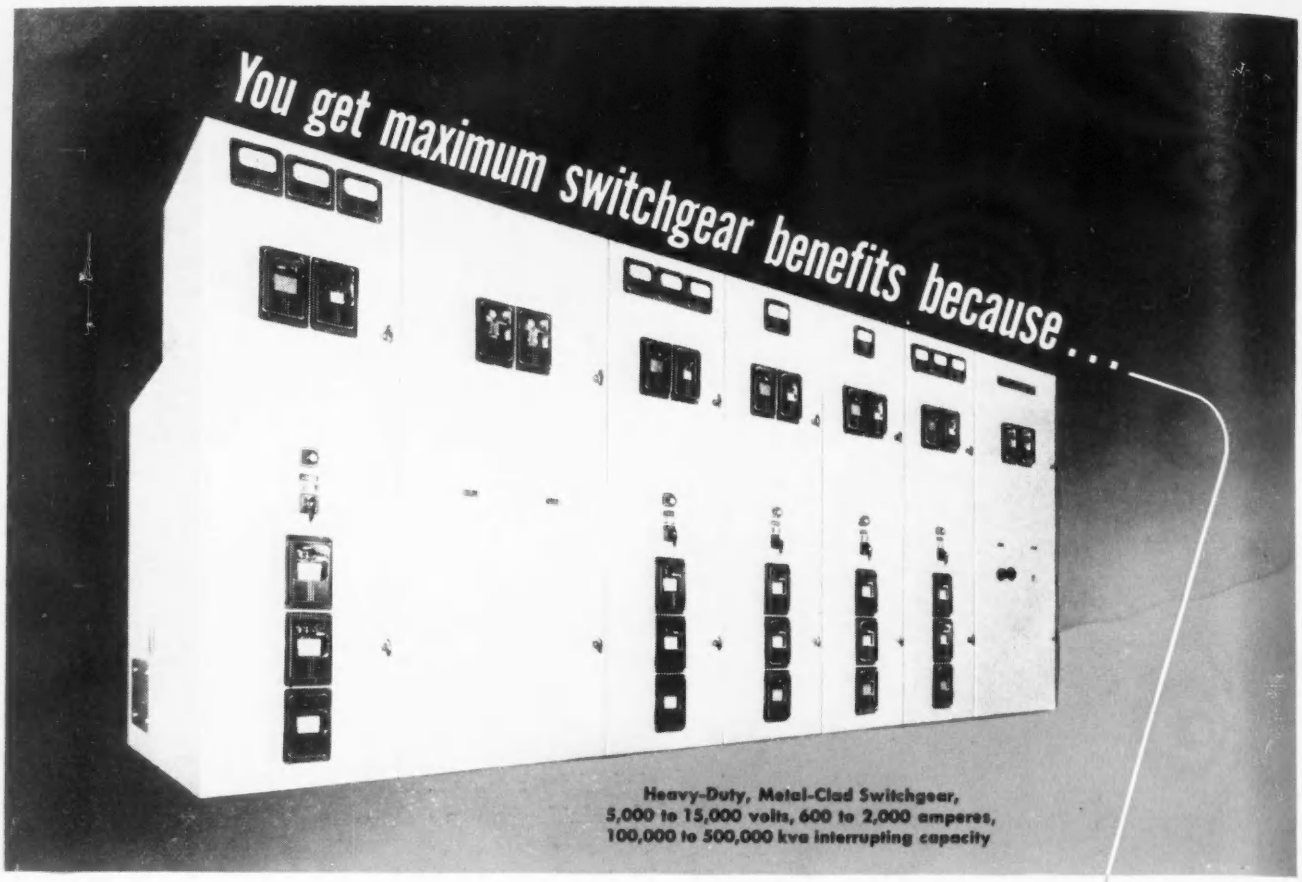
E SHOW

ibit ted power plant cross section demonstrating
erature dicates and records equipment temperatures

FEDERAL ELECTRIC PRODUCTS CO made effective use of transparent Lucite models to illustrate applications of its switches, controls, and wiring systems in factories, farms, stores, and homes

ed a models of gear motors having a variety of
. Righ shown in right foreground is rated at 10 hp

FLYNN & EMRICH CO didn't bother about a model but brought a full-size spreader stoker. It featured an electro-hydraulic drive that operates coal pushers as well as revolving coal distributors


You get maximum switchgear benefits because . . .
Heavy-Duty, Metal-Clad Switchgear,
5,000 to 15,000 volts, 600 to 2,000 amperes,
100,000 to 500,000 kva interrupting capacity

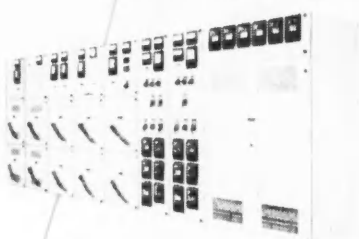
It's a case of getting all 10 in all 3!

When you standardize with Westinghouse Unitized Switchgear you gain ten important benefits—some immediately—others throughout the course of its operation. And you gain these advantages, regardless of the nature of your requirements, because standardization has been applied to all three types of Westinghouse Switchgear—Heavy-Duty, Metal-Clad . . . Light-Duty, Metal-Clad . . . Low-Voltage, Metal-Enclosed.

Standardization benefits you because it permits constant use of proved manufacturing methods that produce high product quality while effecting big cuts in manufacturing time and costs. The results are superior performance . . . quicker delivery . . . lower installed price.

Specifically, standardization provides all the benefits listed below. Just how it does this is explained in booklets currently available. Write—indicating your requirements—to your nearest Westinghouse office or to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60667

Light-Duty, Metal-Clad Switchgear, 5,000 volts, 600 to 1,200 amperes, 50,000 kva interrupting capacity.



Low-Voltage, Metal-Enclosed Switchgear, 600 volts maximum, 15 to 6,000 amperes, 15,000 to 100,000 amp. interrupting capacity.

- Lower planning and ordering costs
- Lower manufactured cost
- Lower installation cost
- Lower operation and maintenance costs
- Greater service continuity
- Greater safety
- Greater versatility
- Longer life
- Shorter manufacturing time
- Superior equipment for outdoor requirements

IT'S STANDARDIZED!

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PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

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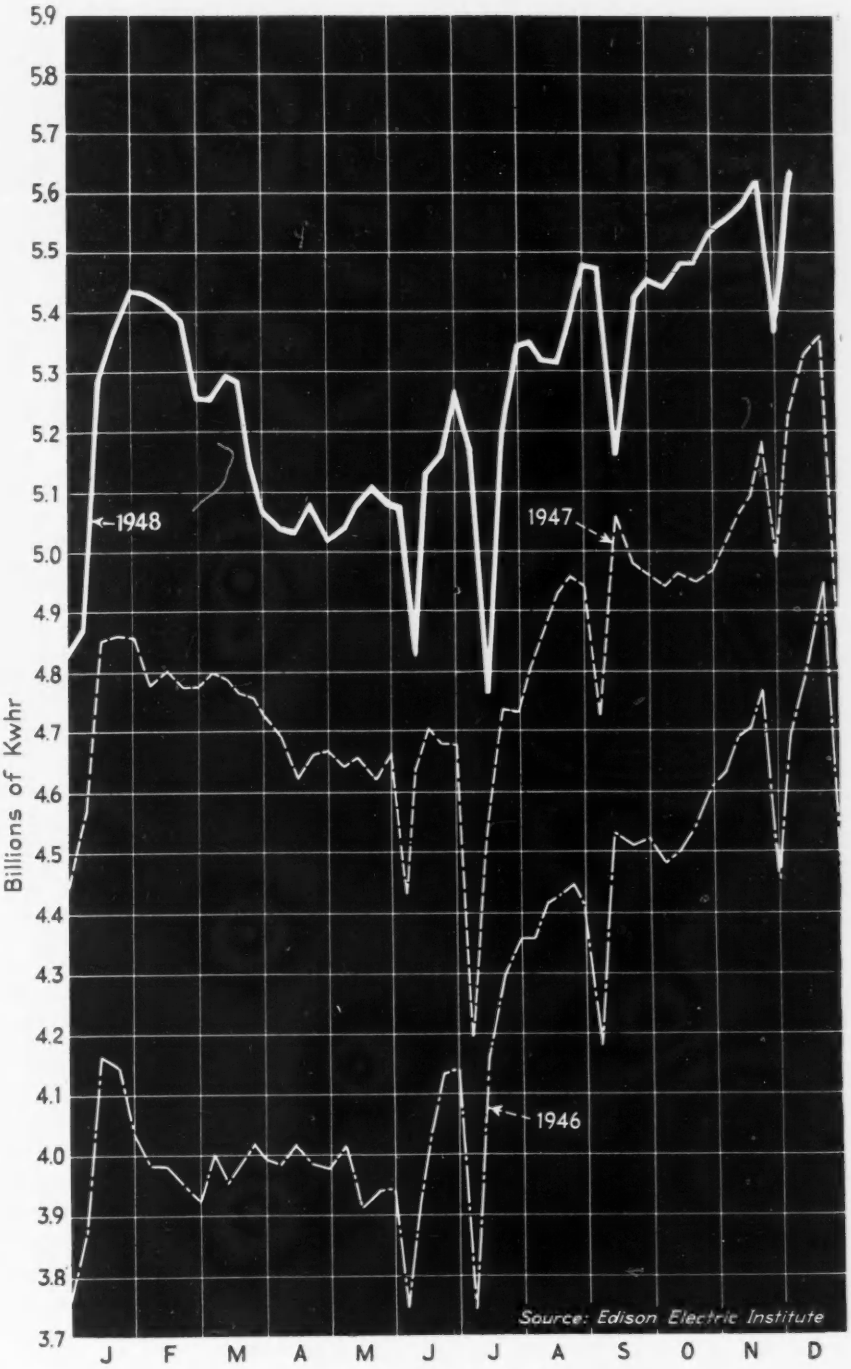


Record Week Starts Climb to December Peak

The expected climb to the December peak started last week when output for the week ended Dec 4 reached the record high of 5,645,686,000 kwhr, but only 8.2% above the corresponding week a year ago.

Most of the news concerns a revision of figures for the week ended Nov 27. The revised total for that week is 5,349,167,000 kwhr, 7.3% above the corresponding week of 1947. The increase over last year for the Southern States was 8.9% instead of 11.1%.

The biggest increase for the week ended Dec 4 was reported by the Rocky Mountain States, 14.6% above last year. The New England States had the smallest gain, only 3%.

Weekly Output, Millions Kwhr

1948		1947		1946	
Dec 4	5,646	Dec 6	5,218	Dec 7	4,673
Nov 27	5,349	Nov 29	4,983	Nov 30	4,448
Nov 20	5,627	Nov 22	5,180	Nov 23	4,765

Percent Change from Previous Year

	Dec 4	Nov 27	Nov 20
New England	+ 3.0	+ 3.1	+ 3.8
Mid-Atlantic	+ 4.9	+ 3.6	+ 4.1
Central Industrial	+ 7.4	+ 6.7	+ 8.0
West Central	+10.3	+ 7.8	+ 8.2
Southern States	+10.6	+ 8.9	+10.7
Rocky Mountain	+14.6	+17.3	+21.1
Pacific Coast	+ 9.4	+ 9.4	+10.9
Total United States	+ 8.2	+ 7.3	+ 8.6

IN THE INDUSTRY

RICHARD N. LARKIN

RECLAMATION BUREAU hopes the next Congress will approve the latest device worked out to offset economic change and inflexible legislative policy.

The inflexible legislative policy began 46 years ago, when the U. S. began to finance reclamation of arid lands. The policy: only those projects would be federally-financed which could pay out.

The realities of economic change have been showing up ever since. Naturally, cheaper projects were built first. Since then, reclamation projects have shown increasing per-acre capital costs. So Reclamation has been between the anvil of a self-liquidation policy and the hammer of rising costs.

A number of devices have been worked out—some by statute, some administratively—to permit a continuation of reclamation and to keep it self-liquidating. In 1906, for example, Congress decreed that the earnings of power projects constructed at reclamation projects might help retire irrigation capital costs—after amortization of the power investment. In 1939, Congress let appropriate parts of an irrigation project's cost be allocated to flood control and navigation. (These being federal responsibilities, costs are not reimbursable. Thus, charges to such items help a project pay out.)

Still another device to help keep reclamation projects self-liquidating came to light in 1944. Then it developed that, without benefit of statute, USBR was applying the 3% interest collected on all Reclamation power investment not to the Treasury, but to the capital cost of irrigation works. Efforts to upset this administrative decision have failed.

The latest device Reclamation has worked out to help make new projects self-liquidating in the face of crushing cost increases is this: It has proposed a "basin-wide pooling (in the Columbia Basin) of revenues from federal power developments to assist in the return of irrigation construction costs." Under such a plan, which it concedes must be ok'd by Congress, USBR hopes to build the Hell's Canyon Dam on the Snake River above Lewiston, Idaho. Reclamation's report on Hell's Canyon concedes that "irrigation from the Hell's Canyon Reservoir is not possible;" but it says that if Reclamation could build the dam and get the power interest thereon, it could, by applying this money elsewhere, render self-liquidating other potential irrigation projects that just can't pay out without some such help.

Reclamation figures that Hell's Canyon would cost $433,660,000, of which $22,950,900 would be charged non-reimbursably to navigation, flood control and recreation. Over 50 years after the eighth of nine 100,000-kw generators was installed, the investment would draw interest totalling $418,427,602. All this would be available to help other irrigation projects.

Army Engineers also want to build Hell's Canyon. Interestingly, their report anticipates that the flow there ultimately will be reduced 55% by future irrigation upstream. If 60% of such withdrawals returned to the stream above Hell's Canyon, the net reduction would be 22% at the power plant. This could be enough to upset USBR's repayment calculations.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Saturable reactors with cores of magnetic alloys having rectangular hysteresis characteristics become magnetic amplifiers offering voltage gains of one million or more.

Reheat for efficiency gain could prove a transitory resort as did superposition for investment economy. Both, like the unit pattern, may accentuate the difficulty in getting good performance when, as and if many of the units have to be fractionally loaded.

Combustion-engine compounding is reported to have been accomplished for aviation engines with 20% gain in output. The flaming exhaust from the explosion cylinders is used in a battery of gas turbines geared back to the main propeller shaft.

Overhead line work is really little different from the way it was done when horse-drawn carts were the line trucks. Some feel that there might be a revolutionarily better way. Hole-diggers and cranes are only a start.

Transmission H-frames can yield to wind forces or resist them. One school favors utilizing the inherent flexibility in the poles; another favors reinforcements to give more positive resistance to deformation.

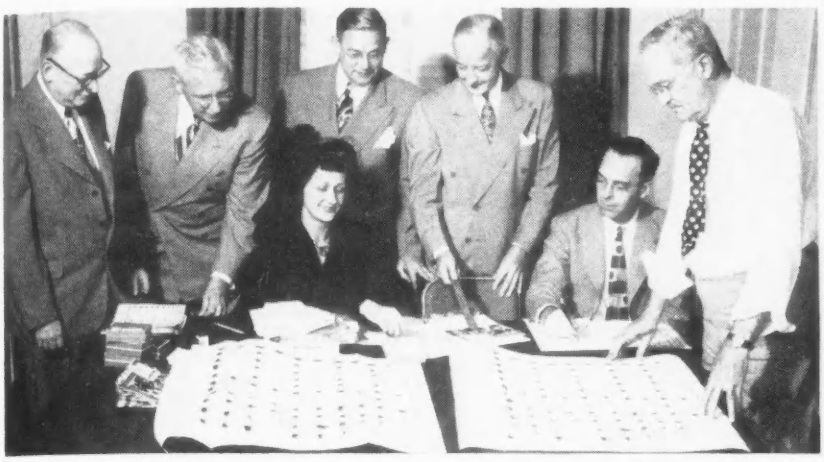
Connections for CT testing can be simplified by using the locking-grip type of pliers as the terminal clips. Jaws should be faced with copper.

Transductors are rugged magnetic amplifiers requiring no filament current. In power-amplifier form, gains of the order of 100,000,000 have been obtained. Sweden is using transductors for voltage regulation of 50,000-kva machines.

Fibrillation is viewed as making indefinitely continued resuscitation futile. Too bad the medical profession hasn't discovered a way of reestablishing rhythm of heartbeat after it has been disrupted.

Velox boilers are reported responding unfavorably to the increasing content of ash in fuel oil as gasoline extraction from crude has increased. The gas passages clog with usually water-soluble and quickly-removable salt formations.

MANUFACTURERS and MARKETS



OFFICIALS of Third International Lighting Exposition watch as Mrs. Ruth Hall draws numbers assigning booths to exhibitors. Onlookers are D. J. Biller, left, vice-president; R. W. Staud, chairman, Publicity and Attendance Promotion Committee; F. J. Martin, secretary, Industrial and Commercial Lighting Equipment Section of the National Electrical Manufacturers Association; G. T. Morrow, chairman, Exposition Operating Committee; W. O. Lueck, seated, assistant exposition manager; and A. B. Coffman, exposition manager. The exposition will be held March 29-April 1 at the Stevens Hotel, Chicago

Electric Motor '49 Demand Predicted Above 1948

Demand for electric motors, generators, and adjustable-speed drives in 1949 will match or may exceed 1948 buying levels, according to estimates of 58 district managers and engineers of the Reliance Electric & Engineering Co who attended a four-day sales forum held recently in Cleveland.

Plant expansion projects and equipment modernization programs now on the drawing boards or in the blueprint stage, installation of additional generating capacity by electric utility companies to meet long-range power requirements, and increased mechanization of operations to offset rising production costs were cited as reasons for their optimistic expectations.

Interest of steel producers and metal fabricators of the Pittsburgh area in the installation of motor drives on finishing equipment continues to run high, C. V. Gregory, district manager, reported.

C. D. Herbert, manager of the company's New York district, reported that Eastern corrugating mills are equipping their automatic folding and taping machines with variable-speed drives to get higher output at lower costs. The trend toward higher and higher machining speeds has become particularly pronounced in Chicago, St Louis, and other industrial centers, R. O. Herbig, central western sales manager, stated.

"Demand for motors and allied equipment throughout the Southwest will continue heavy for some time," F. A. Denison, of Houston, reported. This is due, he said, to the amazing growth of the Gulf coast "chemical empire" and the soaring production of paper and paper products. Establishment of new plants and enlargement of present units in other lines of manufacturing activity are other factors which can be counted on to contribute to greater "motorization" of Southwestern industrial plants and processes, according to Mr Denison.

The picture on the Pacific Coast is similar to that of the Southwest, H. A. Latta, Los Angeles district manager, stated.

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A-C Purchases WAA Plant

Sale of the Gadsden Ordnance Plant near Gadsden, Ala., to the Allis-Chalmers Manufacturing Co of Milwaukee for $575,800 has been announced by WAA. The plant has been under lease to A-C since August, 1947.

Electromaster, Inc, Will Be Acquired by Philco Corp

Philco Corp, Philadelphia, has signed an agreement to acquire the net assets of Electromaster, Inc, subject to approval of Electromaster stockholders, William Balderston, president of Philco, and R. B. Marshall, president of Electromaster, have announced.

In exchange for the plant facilities, patents, and other assets of Electromaster, Philco will tender 68.212½ shares of its authorized but unissued common stock, or one share of Philco for 8.796 shares of Electromaster.

Electromaster, Inc, was established in 1929. Its present plant facilities at Mt. Clemens, Mich., were completed only two years ago. The company will be operated by its present management as a division of Philco Corp and its output of electric ranges will be marketed for the time being under the Electromaster name.

A special meeting of Electromaster stockholders will be held early in January to approve the agreements between the two companies.

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Apex Completes Addition, Starts New Washer Output

Apex Electrical Manufacturing Co has completed and equipped a 50,000-sq-ft addition to its main plant in Cleveland, Ohio, and has started volume production of its new automatic clothes washer, C. G. Frantz, president, has disclosed.

A. C. Scott, vice-president in charge of sales, announced that the new product will be known as the Apex Wash-A-Matic. National marketing of the product will follow as output increases.

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GE Opens First Wing of New Research Lab

General Electric Co has formally opened the first wing of its research laboratory's new $18,000,000 home near Schenectady, N. Y.

Charles E. Wilson, president of General Electric, said the laboratory will be completed in 1950. Its dedication at that time will be combined with a fif-

tieth anniversary celebration of the founding of the GE laboratory by Dr Willis R. Whitney, now 80 years old.

The laboratory will house the company's major research facilities, which for years have been located at the main GE plant in downtown Schenectady. The section just opened was constructed at a cost of more than $8,000,000. The other buildings, on which construction already has begun, will cost another $10,000,000.

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P. R. Mallory & Co Cited for Fine Labor Relations

A citation for "outstanding achievements in human relations in labor" was awarded to P. R. Mallory & Co, Inc, at the recent annual Executive Leadership Forum which was sponsored by the Indianapolis Junior Chamber of Commerce.

The most recent development in the company's policy has been the adoption of a profit-sharing program, in operation since 1947. The Mallory organization signed its first union contract with the United Electrical Workers CIO in 1937. Relations between the union and the company have been harmonious ever since. From the day the contract was signed, there has not been a single hour of time lost as a result of work stoppage.

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Manufacturers Make New Sales Assignments

Electrical manufacturing companies have recently made the following appointments to their sales staffs:

W. N. Matthews Corp. St. Louis, has appointed Hutson Colcock, 616 Baronne St, New Orleans 13, La., as sales-engineering representative in Louisiana and southern Mississippi.

Oliver Iron & Steel Corp. Pittsburgh, has appointed Hugh A. Dewar Pacific Coast sales manager of the pole line hardware division. Mr Dewar was formerly district sales manager with headquarters in Los Angeles. In his new capacity, Mr Dewar will have sales supervision over Oliver's pole line hardware activities in the entire Pacific Coast area.

General Electric Co's Lamp Department has created five new sales districts in its nationwide sales organization. The new sales districts, their locations, and persons appointed to head each district, are as follows: New York City, N. Y., Harold A. Olson manager; Atlantic Sales District, New York, E. G. Agee manager; New Jersey, Newark, Kenneth C. Larabee manager; Niagara, Buffalo, Harry E. Huff manager; Mohawk, Albany, Dean W. Warren manager.

NEW ELECTRICAL CONSTRUCTION

A weekly selection of U. S. electrical construction projects announced by private and government utility systems involving more than $70,000. Also listed are major industrial and construction jobs where electrical work is indicated or implied

UTILITIES

Proposed Construction

Arkansas—C. and L. Electric Co-operative Corp., Lynn Thomasson, mgr., Star City, 43 mi. rural distr. lines and various sys. imprvs., extens., etc. in Lincoln, Jefferson and Drew Counties and vicinity. **$500,000.**

Arkansas—North Arkansas Electric Co-operative Inc., Salem, imprv. present lines and add 335 mi. rural distr. lines, Fulton Co. **$1,300,000.** Southwest Electric Engrs., Jamesboro, consult. engr.

Georgia—Forsyth County Electric Membership Corp., Cumming, 50 mi. rural distr. line, sys. imprvs., incl. 12 mi. tie line and completion previously approved constr., Forsyth Co. **$150,000.**

Kentucky-Tennessee-Indiana — Louisville & Nashville Railroad, C. H. Blackman, ch. engr., 908 W. Broadway, 1, Louisville, Ky., central traffic control sys. between Henderson Ky. and Nashville, Tenn., automatic electric signal board, Evansville, Ind. **$1,820,000.**

Idaho—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., three 10,000 kva. outdoor autotransformers, lightning arresters, one 161 kilovolt, 600 ampere, single throw, switch, one 161 kilovolt, automatic grounding switch, three 138,000 volt insulated outdoor, current transformers, three 138,000 volt insulated, outdoor potential transformers Anderson Ranch Switchyard, Spec. 2480. Plans deposit $1.50. L. N. McClellan, ch. engr.

Iowa—Corn Belt Power Co-operatives, Humboldt, rural distr. lines to supply 11 rural power co-operatives, Humboldt Co. **$5,994,000.** Stanley Eng. Co., Muscatine, engr.

Mass., New Bedford—New Bedford Textile Institute, 1171 Purchase St., plans by Frank Leary, 207 Duff Bldg., 3 story, bsmnt., brick, steel, concrete physics, electronic and mechanical laboratory addn. Textile Institute, **$1,000,000.**

Missouri—Nodaway-North Electric Co-operative, Lawrence Ruckman, mgr., Maryville, addnl. rural distr. lines, sys. imprvs., Nodaway and Worth Counties. **$850,000.**

Montana—U. S. Eng., Fort Peck, Mont., 38,889 kva alternating current generator for installation in Fort Peck Power Plant, Fort Peck, Serial No. Eng. 24-016-49-29.

N. Y., Ogdensburg—Bureau Contracts & Accounts, Albany, power house at St. Lawrence State Hospital.

Tennessee—Holston Electric Co-operative, Rogersville, 131 mi. rural distr. lines and headquarters facilities, Hawkins Co. **$550,000.**

Tennessee—Pickwick Electric Membership Corp., Selmer, 109 mi. rural distr. lines, sys. imprvs. incl. 3 mi. tie line, two-way radio communication sys. and completing previously approved constr., McNairy Co. **$480,000.**

Tex., Austin—City, G. Morgan, mgr., Contr. 4 steam generating units for power plant. $1000,000. Burns & McDonnell Eng. Co., 107 W. Linwood St., Kansas City, Mo., engr.

Washington—Bonneville Power Admin., P. O. Box 3537, Portland, Ore., 27.3 mi. woodpole transmission line between Shelton and Eldon, Inv. 4408, Mason Co.

Low Bidders & Contracts Awarded

Alabama—Tombigee Electric Co-operative, Guin, 202.2 mi. rural distr. power lines, Lamar Co., etc., to Stuart C. Irby Co., 815 S. State St., Jackson, Miss., **$248,221.** Bids 11/17.

Arizona-California-Nevada — Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., Nov. 9, seven 30,000 kva. transformers for Hoover Power Plant, Boulder Canyon Proj., Spec. 2449, from General Electric Co., 650 17 St., Denver, Colo., **$580,000.**

Calif., San Francisco—City and San Francisco Co. Bd. Park Comn., Golden Gate Park, floodlighting sys. and associated lighting work at Kezar Stadium, from Pacific Electrical & Mechanical Co., 1801 16 St., **$129,400;** Kezar Stadium rehabilitation, from Biltwell Constr. Co., 4745 Geary Blvd., **$245,877.**

Fla., Jacksonville—City, miscellaneous power equip. and controls for Power Plant 2 in South Jacksonville, to U S C O Power Equipment Corp., 829 N. 36 Way, Birmingham 4, Ala., **$81,782***** furnishing installing electric equip., to General Electric Co., 1 River Rd., Schenectady, N. Y., **$120,769***** furnishing, installing electric equip., to Westinghouse Electric Corp., East Pittsburgh, Pa., **$76,044.** Grand total $278,595. Awarded 11/24.

Ia., Humboldt—Corn Belt Co-operative, Humboldt, electrical work for power plant extens., to Schneider Electric Wks., 1108 Farnam St., Omaha, Neb., **$121,000;** mechanical work, to Moffet & Troop, 4 Smithfield St., Pittsburgh, Pa. **$314,790.** Bids 10/29.

Kansas—Brown Atchison Electric Co-operative Assn., Horton, 47 mi. rural distr. lines, sys. imprvs., extens., Brown and Atchison Counties, own forces. **$128,000.**

Md., Vienna — Eastern Shore Public Service Co. of Maryland, 1147 Division St., Salisbury, 1 story, brick (steam) power plant, separate contracts. **$5,000,000.** United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., engrs.

INDUSTRIAL, COMMERCIAL & PUBLIC BUILDINGS

Proposed Construction

Ky., Glasgow—City, City Hall, Sampson Hospital wing. **$600,000.**

N. C., Greenville—Pitt County Hospital, Courthouse, 120-bed hospital. $1,400,000. Plans deposit $50 general, $25 mechanical. George Watts Carr, 111 Corcoran St., Bldg., Durham, archt.

Pa., Lancaster—Lancaster General Hospital, Lancaster, 205-bed hospital addn. **$2,632,000.**

S. C., Greenville—Maverick Mills, 144 Addison St., East Boston, Mass., cotton goods mills. **$4,000,000.**

Va., Richmond—State Div. Mental Hygiene, Dr. Barrett, dir., Richmond, plans by Merrill C. Lee, 110 N. 7 St., 1,800 or 2,000 bed State Colony for Negroes, on Elko site, **$1,500,000.**

Wash., Warden—School Bd., Warden, school. **$1,000,000.**

Wash., Yakima—Young Men's Christian Assn., Yakima, youth center bldg. **$1,250,000.**

Low Bidders & Contracts Awarded

Ind., Indianapolis—Kresge Co., 2727 2 St., Detroit, Mich., 5 story, bsmnt., limestone front, brick, rein.-con. store, 23 W. Washington St., to J. L. Simmons Co., 710 Union Title Bldg. Est. **$1,000,000.** Awarded 11/26.

N. Y., Brooklyn—United Dressed Beef, 319-373 Johnson Ave., plant addn., alterations, to Carl Buhr, Inc., 1714 Grand Central Terminal Bldg., New York, Zone 17. Est. **$1,000,000.**

Okla., Tulsa—Tulsa Co., Nov. 22, Booker T. Washington Negro High School, from W. R. Grimshaw, Philtower Bldg., **$1,440,000.**

Pa., Chambersburg — Chambersburg Hospital, Chambersburg, wing addn. to Chambersburg General Hospital. **$2,006,532.**

S. C., Columbia—H. R. Burg, c/o contractor, 121 apartment units, to M. B. Kahn Constr. Co., Lady St. Est. **$1,000,000.**

NEWS ABOUT PEOPLE

PP&L Elects D. R. McClung V-P; Morphey Promoted

D. R. McClung, general superintendent of the Pacific Power & Light Co, Portland, Ore., has been elected vice-

D. R. McCLUNG

president in charge of physical operations of the company, which serves areas in Oregon and Washington. Another PP&L promotion makes L. A. Morphey superintendent of power, responsible for operation and maintenance of production, transmission, and substation facilities, duties formerly performed by J. H. Siegfried, superintendent of

L. A. MORPHEY

power, and Tom Perry, superintendent of the northwest division, both of whom have recently retired.

Mr McClung has been with the company since 1917. In 1936 he was made assistant chief engineer. Four years later he was appointed assistant general superintendent and in 1947 was promoted to the general superintendency of the company.

Mr Morphey joined the staff of the former Northwestern Electric Co in 1922 and in 1941 was transferred to the power department of PP&L.

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NARUC Elects J. F. Craemer of California President

(See Front Cover)

Justus F. Craemer, recently elected president of the National Association of Railroad and Utilities Commissioners, is the oldest California Public Utilities Commissioner in point of service.

He is also perhaps the California commissioner with the widest personal acquaintanceship in the state. For many years Mr Craemer has been active in the California Press Association and has served as president of the group since 1943.

Mr Craemer was appointed to the then California Railroad Commission in 1939 and served as president in 1942. Previously he had held a number of public service posts. In 1937 and 1938 he was a State Building and Loan Commissioner; from 1935 to 1937, assistant director of the State Department of Public Works. He was private secretary to the governor in 1934 and a member of the State Board of Agriculture from 1923 to 1928.

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► Dr Frank C. Bolton, electrical engineer, long-time faculty member and college administrator, has been installed as president of Texas A&M College. Dr Bolton went to A&M in 1909 as teacher of electrical engineering and was made dean of all engineering in 1922. Ten years later he was named dean of the college.

► Stuart P. Gillespie has been named research engineer of the Connecticut Light & Power Co. His headquarters are at Waterbury. Mr Gillespie was with the Jersey Central Power & Light Co for nine years. He served in the U. S. Navy five years and was discharged as lieutenant commander, joining CL&P in 1945.

Becker Appointed Manager of Illinois Co-Op Group

A. E. Becker has recently been appointed general manager of the Association of Illinois Cooperatives. His appointment will become effective on Jan 1, 1949. Mr. Becker entered the power supply business as president and resident manager of the Menard Electric Cooperative of Petersburg, Ill., in 1936. He held the position of president of that cooperative through its formative stages and in 1938 was succeeded by Henry T. Colby. He has maintained the position of resident manager since that date.

For the past six years Mr Becker also has been part-time coordinator for the

A. E. BECKER

Association of Illinois Cooperatives. In his new capacity he will give this association his full time. Mr Becker will be concerned mainly with the problem of coordinating the activities and operations of the 27 cooperatives in the association as well as studying their tax problems. Early in the Illinois Cooperatives' set-up, he was state coordinator for the National Rural Electrification Administration office. Previous to 1936, Mr Becker was in the insurance business in Petersburg. He will be located at the association's new office at 524½ East Capitol Street, Petersburg, Ill.

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► Guy W. Witmer, assistant chief engineer at the Riverside power station of the Savannah Electric & Power Co, has been appointed chief engineer to succeed Arthur J. Monnen, retired. E. W.

GRACEN has succeeded Mr Witmer as assistant chief engineer. Mr Witmer was identified with the Savannah utility from 1927 to 1930 as a student engineer, then joining Gulf States Utilities Co, where he remained until 1945, when he returned to Savannah Electric as assistant chief engineer. Mr Monnen was connected with the Tampa Electric Co before joining Savannah Electric in 1919 as assistant chief engineer. He was made chief engineer in 1945.

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F. R. Fishback Retires As EC&M Board Chairman

F. R. Fishback, chairman of the board of the Electric Controller & Mfg Co, Cleveland, Ohio, has retired. He became identified with Electric Controller in 1905 and in 1925 was elected president, the position he held until 1943, when he became chairman of the board.

R. G. Widdows, president since 1943, will continue in that office and will be executive officer of the company.

Succeeding Mr Fishback as a member of the board is A. C. Dyer, vice-president and sales manager.

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► L. F. HICKERNELL as chief engineer of the Anaconda Wire & Cable Co will direct the engineering and research policy of the company and act as consultant to customers as well as to the executive and manufacturing departments of the company. He will be aided by L. L. CARTER and D. E. ALLEN as assistant chief engineers, both located at Hastings-on-Hudson engineering headquarters. A. A. JONES has been appointed manager, engineering department, reporting to Mr Hickernell. He will be in direct supervision of the engineering and of the research operations. Announcement was also made of the appointment of C. B. PECK, JR. as assistant manager of industrial sales. Mr Peck will act as liaison among mills, headquarters, district offices, and customers. He will also continue to carry on his function as manager of portable cable sales.

► J. G. SANDERS has been appointed purchasing agent of the Electric Power Board of Chattanooga, Tenn., succeeding the late J. Frank Kelley.

► H. G. DILLIN has been appointed commercial manager of the San Diego Gas & Electric Co, San Diego, Calif. Formerly engineer in charge of rates, Mr Dillin succeeds Alfred May, who recently retired. Mr Dillin has been associated with the company since 1924.

Heydecke Made President of N. J. Utilities Group

Franklyn Heydecke, comptroller of Public Service Electric & Gas Co, Newark, N. J., has been elected president of the New Jersey Utilities Association.

F. HEYDECKE

In 1900 Mr Heydecke started in the utility business with one of the predecessors of Public Service, the Essex & Hudson Gas Co. When Public Service was formed in 1903 he was transferred to the general office of the new company. In 1924 he became general auditor of the electric department, in 1940 general auditor of electric and gas departments, and this year was appointed comptroller. Mr Heydecke is a member of the accounting advisory committee of EEI.

OBITUARY

► WILLIAM H. BENTLEY, president of the Bentley, Harris Manufacturing Co, Conshohocken, Pa., died on Nov 30 in Philadelphia after a long illness. He was 55 years old.

► GEORGE R. LUNN, former Lieutenant Governor of New York State, Representative in Congress, and a member of the New York Public Service Commission from 1925 until 1942, died on Nov 27 in Delmar, Calif. He was 75 years old.

► ALDRED K. WARREN, retired managing director of the Japanese subsidiary of the International General Electric Co, died in Mamaroneck, N. Y., on Nov 20, at the age of 82. His last assignment by International General Electric was that of reorganizing, building, and equipping the Shibaura Engineering Works in Tsurumi, a Tokyo suburb, which was jointly owned by GE and the Mitsui interests. Mr Warren was born in England, came to Canada in 1885, and joined the Canadian Pacific Railroad. He made his first connection with General Electric in 1887, when he went to Schenectady, N. Y., as an electrical engineer for what was then known as the Edison General Electric Co. He left after six years to form his own electrical engineering and construction firm in New York. Later he became associated with International GE. Mr Warren was a member of the Edison Pioneers.

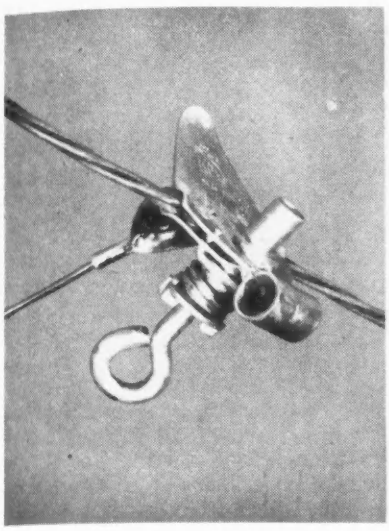
► EDWARD W. ASHMEAD, assistant to the general manager of the Alabama Power Co, died on Nov 29 in Birmingham. Mr Ashmead was born in Philadelphia, Pa., in 1889 and was graduated from Cornell University in electrical and mechanical engineering. He became associated with Alabama Power in 1917 as supervisor of the Anniston plant. After service in World War I he returned as district manager at Gadsden and later became assistant commercial manager in Birmingham. Mr Ashmead held several executive positions with Southeastern Power & Light Co and with Commonwealth & Southern Corp before his appointment as sales manager for Tennessee Electric Power Co in 1934. He returned to Alabama Power in 1939 as assistant to the general manager.

► WILLIAM C. STERNE, president of the Arvada Electric Co, Denver, Colo., died at his home in that city on Nov 28 after a short illness. Mr Sterne was born in Peru, Ind., in 1869. Following graduation from Harvard University in 1891, he travelled extensively in Europe and went to Colorado in 1895. For the past 15 years Mr Sterne had served as treasurer of the Rocky Mountain Electrical League.

► G. GORDON BROWNELL, manager of the tax department of the Cities Service Co, New York, died on Nov 30 at his home in Westfield, N. J. He was 64 years old. Mr Brownell was born in Souris, Prince Edward Island, Canada. He attended the University of Denver, Colo, and was associated with the Denver Gas & Electric Co from 1904 until he joined Cities Service in 1910 as manager of its accounting department. He was appointed to head the tax department in 1917.

► ARCHIBALD L. JONES, 48, formerly a power sales engineer with the Boston Edison Co, died at Salem, Mass., Nov 22. Born in Middleton, Mass., he served for some time as electric light commissioner for that municipality.

NEW EQUIPMENT



Live-line Tap

A HOT-LINE clamp, developed for use as a transformer tap and for connecting coupler units of telephone systems to power lines, has been announced by Thomas & Betts Co, Elizabeth, N. J.

Known as Cat. 650, the clamp features: protected lubricated leads on eyebolt; belled-mouth for ease of wire entrance; wide contact surface area; phosphor-bronze spring to take up wire "set"; and light weight.

The design provides for a balanced fitting that weighs 10 1/3 oz. Balanced feature is claimed to eliminate the possibility of the clamp's rotating around the conductor. In a test the new clamp has withstood over 100 million cycles of vibration. Heat run tests show that temperature rise of the clamp is less than the cable. (See ELECTRICAL WORLD, Dec. 4, 1948, page 116.)

Wire sizes with which the clamp can be used are: copper No. 8 through No. 1/0, Copperweld copper 3 No. 6, 4A, 6A, 8A, 8C, 9½D and 12.

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Load Centers

A LINE of Quicklag load centers in basic circuit enclosures of two, four or eight is available from Westinghouse Electric Corp. Box 868, Pittsburgh 30, Pa. These make possible automatic protection for home wiring circuits.

Some outstanding features of the load center are: Use of Quicklag circuit breaker; circuit protection cannot be changed; breaker cannot be held closed against shorted or overloaded circuits; arcs are snuffed out fast by the De-Ion principle.

The load center is designed to accommodate breakers of 10, 15, 20, 30, 40 and 50-amp ratings for operation in 2-wire SN 125-v a-c or 3-wire SN 125/250-v a-c circuits.

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All-Wheel-Drive Trucks

MARMON-HERRINGTON CO, INC, Indianapolis, Ind., has announced the Q-Series of heavy-duty all-wheel-drive converted Ford Model F-7 trucks.

Gross vehicle weight for 4-wheel-drive trucks is 21,500 lb; for 6-wheel-drive trucks, 35,000 lb. Wheelbases range from 136½ in. to 220 in. All models are powered by the 145-hp V-8 engine and have ten forward speeds and two reverse. A final reduction in transmission of 89.215 to 1 assures tractive power for tough, off-the-road operations.

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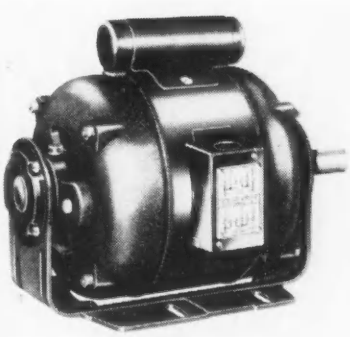

Fractional Hp Motors

AS ADDITIONS to its line of rigid base, ball-bearing motors, the Hoover Co, Kingston-Conley Division, North Plainfield, N. J., is introducing a group of resilient and rigid base motors, built to NEMA mounting standards. These new motors, available in ratings of ¼, ⅓ and ½-hp, are single phase, 1725-rpm, dual voltage, capacitor-start motors, furnished with either sleeve or ball bearings.

Inquiries should be addressed to Electric Motor Division, The Hoover Co, North Canton, Ohio.

Fluxmeter Calibrator

A NEW DEVICE for calibrating both the company's indicating fluxmeter and the fluxmeter-type photoelectric recorder has been announced by General Electric's Meter and Instrument Divisions.

The fluxmeter calibrating unit consists of an Alnico magnet rod and a housing with a built-in search coil which is tapped and connected through a selector switch and terminal post. The magnet, one end of which is painted black, is approximately 10 in. long and ⅝ in. in diameter. By the calibrating operation each millimeter of scale reading will be equivalent to a known value of flux-linkages.

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Temperature Recorders

AVAILABLE with one, two, three or four pens and designed for easy installation of the actuating system and pen mechanism, gas-filled temperature recorders and recording pressure gauges are made by the Penn Industrial Instrument Corp, 3116 N. 17th St, Philadelphia, Pa. The manufacturer states that a 1-pen recorder can be easily converted into a 2, 3 or 4-pen instrument, even in the field.

Temperature tube systems feature an all stainless steel, Heli-arc welded construction. A standard bulb design is arranged so that it can be converted into any of the usual apparatus connections: Union flange or hub with bendable extension; union flange or hub with rigid extension; union with separable socket with or without extension neck; and split-flange joint.

ELECTRICAL BUSINESS OUTLOOK

INDUSTRIAL PRODUCTION has declined slightly in recent weeks. November holidays account for some slack, but output for the month dropped more than seasonally. This accounts for the failure of power production to outstrip 1947 figures by a greater margin during November.

Power sales showed the smallest gain in the heavily industrialized New England and Middle Atlantic states. If residential and commercial loads weren't climbing, these regions would have shown losses.

This dip, however, is no sure sign that industrial power demand is headed downward. Industrial production had made a new peacetime record in October, when the Federal Reserve Index hit 195% of 1935-39. That's pretty close to the ceiling attainable with present manpower and material supplies. So it won't be surprising if industry drops below this peak in some months. But no real let-up in industrial loads is yet in sight.

NEW CONSTRUCTION of homes, stores and other power-using projects continues to be limited by shortages of labor and materials. In the first ten months of 1948, the construction industry put in place $14.7 billion worth of work, a 31% gain over last year. But much of this dollar increase represents higher prices. In terms of bricks and mortar, building has only gained 5% to 10%.

Construction volume depends on getting more of the basic materials—lumber, structural steel, and cement. Lumber production is running only 2% ahead of last year. And no increase is likely in 1949. Cement production for the full year 1948 may show a 7% gain over 1947. But production is close to capacity, can't increase next year.

There's more hope of increased steel supplies. The steel industry will enter 1949 with a million tons more basic capacity than it had to start 1948. But demand is rising too. So, about the only way to get much more steel available for construction projects would be through government allocations. Otherwise, a gain of about 5% is all that can be expected for structural types.

Add this tight materials picture to the continued shortage of skilled construction labor. It means total new construction in 1949 probably won't top this year by much over 5%. That's one benchmark for electric company planners in figuring growth of load.

TELEPHONE COMPANY EXPANSION involves many problems common to growth of electric utilities. Since V-J Day the number of telephones in use has increased 40%. To provide this service the Bell System has spent about $3 billion, has to raise $2.6 billion more. Much new financing is coming.

Big help in financing telephone expansion has been the substantial number of rate increases received. Increases granted since the war now total $170 million yearly. And further applications amounting to $240 million yearly are pending.

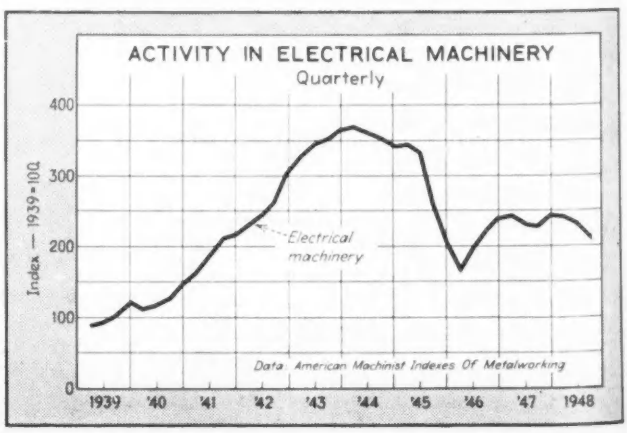
Higher rates have increased the flow of cash from telephone operations. They have also permitted maintenance of the celebrated $9 dividend rate. This helps in flotation of new securities. Power companies have been slower in obtaining rate boosts.

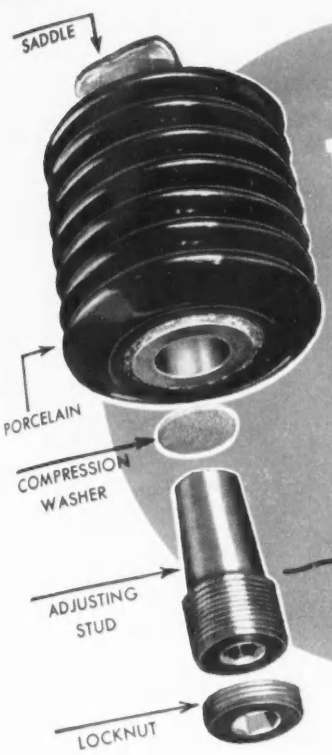
ACTIVITY IN the electrical machinery industry fell off slightly in the third quarter. *American Machinist* index of metalworking production showed a 2% decline for the electrical manufacturers.

The trend throughout 1948 has been a slow decline in unit production. However, dollar sales have been climbing. In September, dollar shipments of electrical machinery rose 22%. These figures reflect the cost and price advances which have been taking place in the industry.

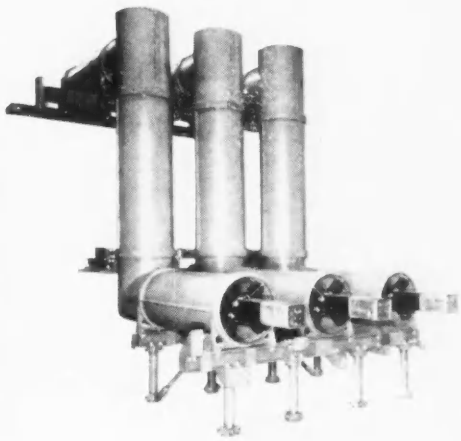
Inventories of electrical manufacturers have been rising too. In the third quarter they averaged 4% above the second quarter, measured in dollars. Each month of 1948 the figure has gone higher. This added value of inventory has called for lots of working capital. And it could be dangerous if sales fell off.

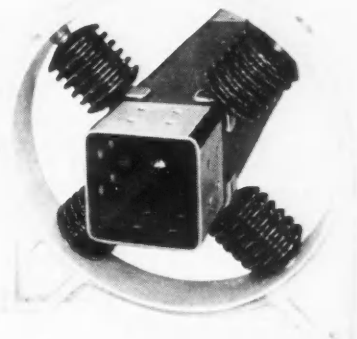
Electrical machinery companies will have a tough struggle to get prices down and unit volume up. Most of their new facilities are completed. But the steel they need is still short. And the industry will certainly face new wage demands in the spring.





Rocked in a cradle to beat heat!





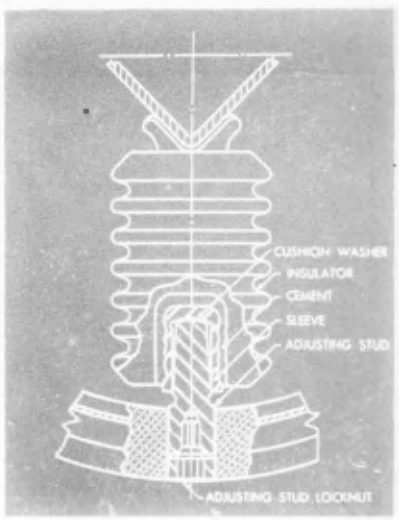
● Ever stand near a bus structure that is carrying 5000 Amperes at 15 KV? There's heat there, and plenty of it. But it's variable heat because of the varying current conditions. The bus conductors feel the variations in heat and expand and contract accordingly. This means that a conductor must be supported in such a way as to allow for thermal expansion movement.

The best supports to use are high-strength porcelain insulators. But porcelain — in order to be used most advantageously and economically — should be subjected only to compression forces. Cantilever and side stresses must be eliminated — and thereby hangs a tale of I-T-E Engineering.

In the I-T-E Isolated Phase Bus Structures, the stresses on insulators are limited *to compression* by the use of a socket type insulator support, which allows the insulator to pivot and follow the movement of the conductor through a temperature change. This action is accomplished with a supporting stud of special shape, fitted into the hardware of the insulator. This stud allows the insulator to rock, yet still positions it positively in the ring. This rocking motion is enough to allow for normal thermal expansion, but if more freedom is needed, the conductor is free to slide in the special saddle supporting it.

This is a typical example of an unusual problem solved by I-T-E engineers. The better design of bus conductor supports is just one example of I-T-E'S careful design right down to the last detail. With I-T-E, quality is paramount — and the quality of the whole unit calls for thorough planning of its smallest detail.

It is this strict attention to detail — this insistence on quality throughout — that has earned I-T-E its world-wide reputation as a maker of the finest in switchgear and power equipment.



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Allis-Chalmers Certified Service shops are located in major industrial centers throughout the country. New shops are being appointed continuously and most smaller centers will soon be covered. To find the shop nearest you, call your closest Allis-Chalmers District Office.

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